

FIRST RECORD OF WHITE GROUPER, *EPINEPHELUS AENEUS* (SERRANIDAE) IN THE SOUTH EASTERN ADRIATIC. Branko GLAMUZINA, Institute of Oceanography and Fisheries, Laboratory of Ecology and Aquaculture, POB 83, Akvarij, 20000 Dubrovnik, CROATIA [branko@labdu.izor.hr] (1), Pero TUTMAN (1), Audrey J. GEFFEN, Port Erin Marine Laboratory, University of Liverpool, Isle of Man, United-Kingdom (2), Valter KOŽUL & Boško SKARAMUCA (1).

RÉSUMÉ. - Premier signalement du mérou blanc, *Epinephelus aeneus* (Serranidae) dans le sud-est de l'Adriatique.

Deux spécimens de mérou blanc, *Epinephelus aeneus* (Serranidae), ont été capturés en 1998 et 1999 avec des filets dérivants dans les eaux de la mer Adriatique sud-orientale près de Dubrovnik (42.5°N, 22 février 1998, P = 150 g, LT = 28 cm; septembre 1999, P = 109 g, LT = 21.5 cm). La colonne vertébrale du premier spécimen était déformée et cette déformation était visible de l'extérieur. Ces signalements de *E. aeneus*, considérée comme une espèce tropicale, peuvent être interprétés comme de nouveaux indices confirmant le réchauffement actuel des eaux de la Méditerranée nord-occidentale.

Key words. - Serranidae - *Epinephelus aeneus* - MED - Adriatic sea - First record.

The concept of recent tropicalisation of Mediterranean waters (Francour *et al.*, 1994) is supported with first records of more than eighty fish species (<http://www.ciesm.org/atlas/appendix1.html>) previously not reported. The less investigated area is recent changing of geographical distribution of native Mediterranean fish species.

Groupers of the genus *Epinephelus* are mostly tropical species and their distribution in subtropical and temperate waters is limited, and only five species are native in Mediterranean waters (Heemstra and Randall, 1993). The recent movement of some species, such as *Epinephelus marginatus* (Lowe, 1834) in Mediterranean and Adriatic waters, to colder waters and their reproduction in new areas, has been suggested to be a consequence of warming of Mediterranean waters (Francour *et al.*, 1994; Dulčić and Lipej, 1997; Zabala *et al.*, 1997).

During the past ten years several papers have been published on the occurrence of new fish species in Adriatic waters (Lipej *et al.*, 1996; Dulčić *et al.*, 1999). The new records are mostly of thermophilic species. The movement of these species is also cited as evidence for the warming of Mediterranean waters.

In this paper we present data on first record of white grouper, *Epinephelus aeneus* (E. Geoffroy Saint-Hilaire, 1817) in the southeastern Adriatic.

Results

The white grouper, *Epinephelus aeneus* was not previously recorded for south eastern Adriatic nor is included in the latest list of Adriatic ichthyofauna (Jardas, 1996). According to Heemstra and Randall (1993) the species distribution was limited to 40°N (Fig. 1). One white grouper specimen (W = 150 g; TL = 28 cm) was caught on 22 February 1998 and the other (W = 109 g; TL = 21.5 cm) (Fig. 2) in September 1999 with driftnet few kilometers from Dubrovnik (42.5°N latitude) (Fig. 1) and maintained in our laboratory. Divers have also reported catching white grouper of 2-3 kg in the same area, but the identification has not been verified independently. The main species characteristic for distinguishing *E. aeneus* from other grouper species is 3 or 4 pale blue (or white) lines across the operculum. All other important characters fit well with the species description in Heemstra and Randall (1993) (Table 1).

Discussion

The capture location is around 400 km north of the northern limit of distribution published earlier (Tortonese, 1986; Fisher *et al.*, 1987; Heemstra and Randall, 1993). This marked movement in the last ten years could be a sign that white grouper is in the process of colonization of new areas in the northern Mediterranean and Adriatic. The same situation has occurred in the Adriatic with dusky grouper (Dulčić and Lipej, 1997). The colonisation of new areas by different grouper species could lead to significant changes in the ichthyofauna composition in new areas. As a top carnivorous species and among the largest coastal fish species, groupers could influence the behaviour and ecology of many native fish species and affect local artisanal fishery (Glamuzina, 1999).

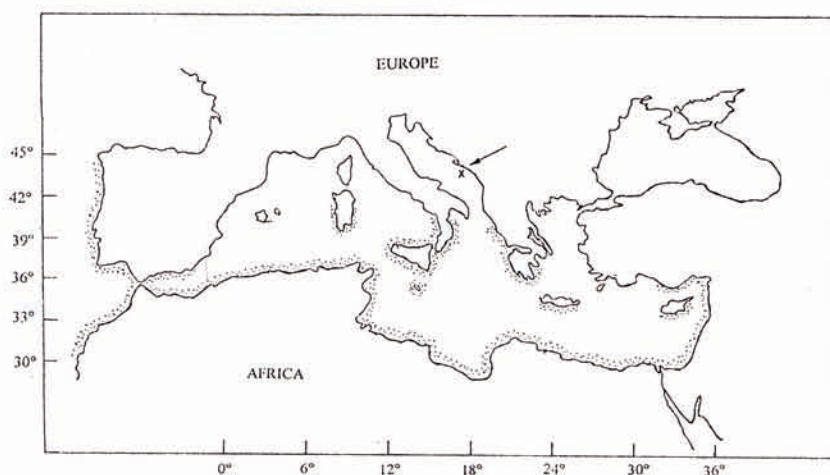


Fig. 1. - Area of distribution of white grouper, *Epinephelus aeneus* (after Heemstra and Randall, 1993) and place of first record in the Adriatic (arrow).



Fig. 2. - White grouper, *Epinephelus aeneus* (W = 109 g; TL = 21.5 cm) caught in September 1999, near Dubrovnik in southeastern Adriatic.

Table I - Some meristic characters of caught white grouper, *Epinephelus aeneus* compared with description in Heemstra and Randall (1993).

	Heemstra and Randall (1993)	First specimen	Second specimen
Dorsal fin rays	XI + 14 - 16	XI + 16	XI + 16
Anal fin rays	III + (7)8(9)	III + 8	III + 7
Pectoral fin rays	18-19	18	18

The fact that one white grouper caught in the south eastern Adriatic had a spinal column deformation could be explained by many reasons as proposed by Schäperclaus (1992). The most

likely explanation is that the temperature regime was unfavourable during embryogenesis compared to warmer southern waters.

Acknowledgements. - This research was executed under ALIS project 048, co-financed by The British Council and Croatian Ministry of Science and Technology.

REFERENCES

- DULCIĆ J. & L. LIPEJ, 1997. - New records of marine fishes from the Slovenian coastal waters. *Falco, J. Ornith. Ass.*, 12: 35-40.
- DULCIC J., GRBEC B. & L. LIPEJ, 1999. - Information on the Adriatic ichthyofauna: Effect of water warming? *Acta Adriat.*, 40(2): 33-43.
- FISCHER W., BAUCHOT M.-L. & M. SCHNEIDER, 1987. - Fiches FAO d'identification des Espèces pour les Besoins de la Pêche (Révision 1). Méditerranée et mer Noire. Zone de Pêche 37. Vertébrés. Vol. II, pp. 761-1530. Rome: FAO.
- FRANCOUR P., BOUDOURESQUE C.-F., HARMELIN J.-G., HARMELIN-VIVIEN M. & J.-P. QUIGNARD, 1994. - Are the Mediterranean waters becoming warmer? Information from biological indicators. *Mar. Poll. Bull.*, 28: 523-526.
- GLAMUZINA B., 1999. - Recent changes of Adriatic ichthyofauna: Threat or benefit to local fishery. In: Precautionary Approach to local Fisheries in the Mediterranean Sea. Kerkena Island, 1999. CIESM Workshop Series, n°7: 71-72.
- HEEMSTRA P.C. & J.E. RANDALL, 1993. - FAO Species Catalogue. Vol. 16. Groupers of the World (Family *Serranidae*, subfamily *Epinephelinae*). FAO Fish. Synop., 125: 382 p. Rome: FAO.
- JARDAS I., 1996. - Jadranska ihtiofauna. Školska knjiga. 533 p. Zagreb.
- LIPEJ L., SPOTO M. & J. DULCIC, 1996. - *Plectorhinchus mediterraneus* from off north east Italy and Slovenia, the first records of fish of the family *Haemulidae* from the Adriatic Sea. *J. Fish Biol.*, 48: 805-806.
- SCHÄPERCLAUS W., 1992. - Fish diseases Vol. 2, 1398 p. Rotterdam: Balkema.
- TORTONESE E., 1986. - *Serranidae*. In: Fishes of the North-Eastern Atlantic and the Mediterranean, Vol. 2 (Whitehead P.J.P., Bauchot M.-L., Hureau J.-C., Nielsen J. & E. Tortonese, eds), pp. 780-792. Paris: UNESCO.
- ZABALA M., GARCIA-RUBIES A., LOUISY P. & E. SALA, 1997. - Spawning behaviour of the Mediterranean dusky grouper *Epinephelus marginatus* (Lowe, 1934) (Pisces, Serranidae) in the Medes Islands Reserve (NW Mediterranean, Spain). *Sci. Mar.*, 61(1): 65-77.

Reçu le 06.12.1999

Accepté pour publication 03.03.2000